

REMARKS

Specification

Specification has been amended to correct a translation inconsistency. No new matter is added.

Status of the Claims

Claims 1, 15-19 and 22 are pending. In the Office Action, claims 15-19 and 22 were rejected. In this response, claim 1 has been amended. No new matter has been introduced.

Rejections Under 35 U.S.C. §112

Claims 1, 15-19 and 22 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The same claims were also rejected under 35 U.S.C. §112, second paragraph, as being indefinite. In particular, the Examiner states that claim 1 is not consistent with Table 6 of the instant specification on which the limitation is based.

In this response, claim 1 has been amended to recite, “forming a hydrophilic coating on the molding portion by using at least one hydrophilic material that contains a bond element selected from the group consisting of Al-O, Ti-O, Mg-O, Si-O and Ca-O.” The term “bond element” was inadvertently omitted in the previous amendment and can be found in Table 6. Thus, amended claim 1 complies with the written description and clearly points out the subject matter.

Accordingly, reconsideration of the rejections under 35 U.S.C. §112 is respectfully requested.

Rejections Under 35 U.S.C. §103

Claims 1, 15-19 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Harada (JP9-272901) in view of Sugaya (US Pub. 2002/0102318), and further in view of Skiles (US

6,169,059). Alternatively, claims 1, 15-19 and 22 were also rejected under 35 U.S.C. §103(a) as being unpatentable over Harada in view of Sugaya, and further in view of Murata (WO 97/487783).

Hydrophilic Coating

The Examiner states that Harada discloses the invention substantially as claimed. However, the Examiner concedes that Harada does not describe the step of forming a hydrophilic coating on the molding portion. To make up for this deficiencies of Harada, the Examiner states that Sugaya teaches that “the die is formed with a coating on the molding portion which may include an A_2O_3 material” (Office Action, page 5). Applicant respectfully disagrees.

First, claim 1 has been amended to correct the informality and further define the invention, in particular, the process of hydrophilic coating. Support for this amendment can be found in paragraphs [0061] and [0062] of the published application.

The objective of the present invention is to provide a method for forming a high density molded powder product by forming a fine and uniform film of lubricant on a portion of the mold (paragraph [0009]). The hydrophilic coating of the mold is an essential step that is performed *before* the spraying into the mold of an aqueous solution containing a lubricant to improve the wetting action of the aqueous solution. This process also provides a superior uniformity to the lubricant film formed after evaporating the solution. In the present invention, the interior of the mold is coated with at least one hydrophilic material that contains a bond element selected from the group consisting of Al-O, Ti-O, Mg-O, Si-O and Ca-O.

Furthermore, the hydrophilic coating of the present invention is formed such that “a contact angle relative to the aqueous solution on the surface of the molding portion with the hydrophilic coating is smaller than a contact angle relative to the aqueous solution on the surface of the molding portion without the hydrophilic coating” (Claim 1, paragraph [0061]). By forming the hydrophilic coating under the above condition, the wetting action of the aqueous solution on the molding portion can be improved (paragraph [0061]). No prior art references teach or suggest the “contact angle” or the process of hydrophilic coating based on the contact angles as described in claim 1.

In contrast, Sugaya merely discloses a coating method that involves forming a layer in a die by PVD treatment or plasma CVD treatment. Sugaya fails to describe the *prior* hydrophilic coating process *followed by* the application of an aqueous solution as required by the present invention. Furthermore, in Sugaya, coating of a die is provided to enhance the wear resistance and reduce the friction of the inside wall of the die cavity (paragraph [0009]),” but by no means is it provided to improve the *wetting action* of an aqueous solution as described in the present invention. Accordingly, neither Sugaya, nor any general knowledge available to one skilled in the art, provides any motivation for one skilled in the art to perform a hydrophilic coating process *prior to* the application of an aqueous solution to the molding portion.

Thus, neither Sugaya, nor any other prior art references cited by the Examiner, teaches the limitation of the hydrophilic coating as recited in amended claim 1.

Water Soluble Lubricant

In the Office Action of November 24, 2010, the Examiner states that although Harada does not teach a water soluble lubricant with at least 3g of solubility for 100g of water at 20C, Skiles teaches that “the solubility of the *dextrin* is greater than 90% (see col. 2), thus meeting the limitation of the claim” and that borax also meets the limitation of the claim regarding solubility (page 6).” Applicant respectfully disagrees.

Claim 1 has been amended to delete “sodium tetraborate” from the group of lubricants because it does not meet the solubility recited in claim 1. The solubility of sodium tetraborate for 100g of water at 20°C is 2.56g according to International Programme on Chemical Safety.

Skiles teaches water soluble lubricants comprising borax (sodium tetraborate), dextrin, graphite, xanthan gum, none of which is recited in amended claim 1. Accordingly, none of the water soluble lubricants taught by Skiles meets the requirements for the lubricant of the present invention, which require “at least one member selected from the group consisting of dipotassium hydrogen phosphate, disodium hydrogen phosphate, trisodium phosphate, sodium polyphosphate, riboflavin sodium phosphate, potassium sulfate, sodium sulfite, sodium thiosulfate, sodium dodecyl sulfate, sodium dodecylbenzenesulfonate, Food Blue No. 1., Food Yellow No. 5., sodium ascorbyl

sulfate, sodium silicate, sodium tungstate, sodium acetate, sodium benzoate, sodium ascorbate, potassium stearate, sodium hydrogen carbonate, sodium carbonate and potassium nitrate” (Claim 1).

Accordingly, Skiles does not teach the limitation of water soluble lubricant recited in amended claim 1

Prior Art Murata

Murata discloses a waterborne lubricant for use in the cold plastic working of metals. The method of lubrication comprises the steps of coating a solid metal substrate with a layer of waterborne lubricant and drying the layer of waterborne lubricant so that the liquid layer is converted to a corresponding solid lubricant layer. First, Murata does not teach or suggest any hydrophilic coating process. Second, in Murata, “the solid lubricant is homogeneously *dispersed* (page 4, line 5).” In the present invention, the water soluble lubricant is required to be “*completely dissolved* in water” (Claim 1). Being homogeneously dispersed does not mean “completely dissolved.”

Accordingly, Murata does not satisfy all of limitations that are missing from Harada, Skiles, and Sugaya.

In light of the discussion above, neither Harada, Skiles, Sugaya, or Murata, nor any combination thereof, teaches or suggests all of the features recited in claim 1, and thus, claim 1 is unobvious in view of the prior art. Claims 15-19 and 22 directly or indirectly depend from claim 1, and thus, are unobvious as well.

Accordingly, Applicant respectfully requests that the rejections under U.S.C. §103(a) be withdrawn.

Double Patenting Rejection

Claims 1 and 15-19 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting over copending US Application No. 10/531,813 (US ‘813), in view of Sugaya.

In the comments above, the Applicant has already discussed the fact that Sugaya does not teach or suggest the hydrophilic coating process as recited in amended claim 1.

In addition, the US '813 application was abandoned on April 6, 2010. A CIP application was filed based on the US '813, however, it was filed under a different assignee. Thus, the nonstatutory obviousness-type double patenting is moot.

CONCLUSION

In view of the above amendments and remarks, Applicants believe the pending application and all pending claims are in condition for allowance, and earnestly solicit same.

If the Examiner feels that any remaining issues can be resolved by a Supplemental or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

The Commissioner is hereby authorized to charge any unpaid fees deemed required in connection with this submission, or to credit any overpayment, to Deposit Account No. 50-4570.

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Respectfully submitted,

By 

Melvin C. Garner

Registration No.: 26,272

LEASON ELLIS LLP.

81 Main Street

White Plains, New York 10601

(914) 821-8005

(914) 288-0023 (Fax)

Attorneys/Agents For Applicant